

PPRC Infrastructure and Optimization

John Lefor

Infrastructure and Optimization Direction

- **Team Introduction**
- **Vulcan Client**
- **Heterogeneous Components**
- **Run Time Optimization**

Team Mission

- **To develop technologies that improve the performance of Microsoft products**
- **Delivery Vehicles:**
 - **Tools**
 - **SDK's**
 - **Publications**

The Team

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Vulcan

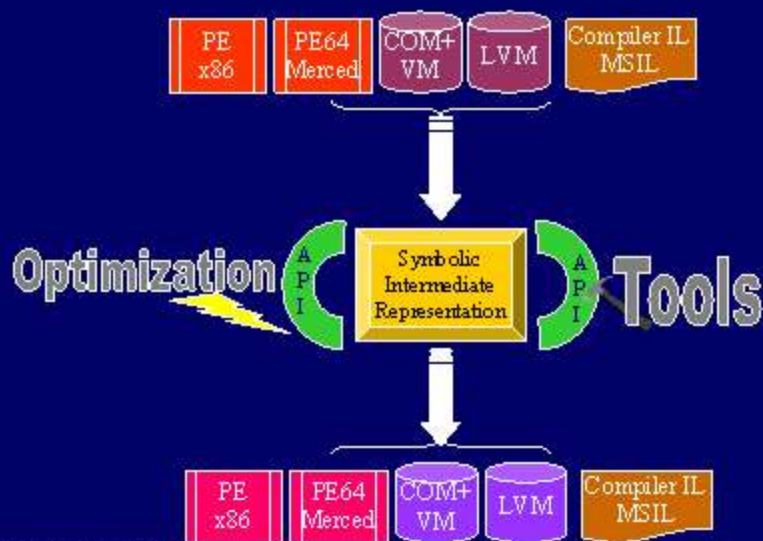
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Vulcan



- **Vulcan 1.1 – A general toolkit for binary analysis and editing**
 - **Vulcan provides a powerful and easy way to analyze and modify executables**
 - **API allows custom tools to be written quickly**
 - **Handles PE Binaries for x86, IA64 and CEF Bytecode.**
 - **Adaptable to additional architectures**

The Vulcan Framework

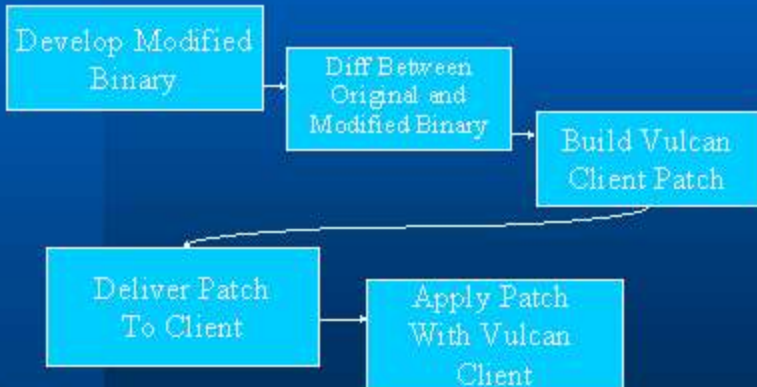




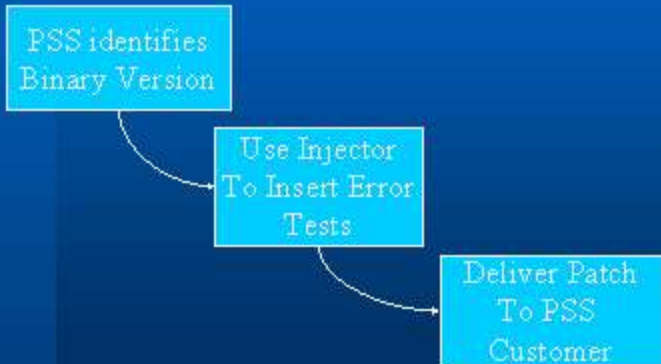
Vulcan Client

- **Supports low overhead binary modification**
- **Allows deployment of Client side binary modification**
- **Examples:**
 - Vulcan Client allows for extremely compact binary level patching
 - PSS analysis and resolution of customer problems
 - Ongoing license modification (encryption)

Vulcan Patch Delivery



PSS Problem Analysis



Heterogeneous Components

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Heterogeneous Components

- **Supported PE Formats**
 - X86
 - IA64
 - CEF Bytecode
- **Provide Support to switch between instructions**
- **Generated binary including multiple formats**

Heterogeneous Components

- **Additional Vulcan inputs raise the possibility of creating mixed binaries**
 - Trade off size versus speed
 - Examples:
 - Mixing IA64 and x86 will allow good caching/paging and good performance
 - Mixing CEF with native code blends portability with fast execution

Run Time Optimization

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Run Time Optimization

- **Look at whole spectrum of performance**
- **Use Machine/user specific optimization**
- **Delayed Optimization Opportunities**
 - Install time
 - Load time
 - Run time
 - Post-run time
- **Delivery Methods**
 - Transparent dynamic optimization/profiling
 - Performance service over internet

Client Side Run Time Optimization



Runtime
Optimization/Profiling

10/25/99

Client/Server

Run Time Optimization Schematic

Annotated,
Debug-enabled
Application



Runtime
Optimization/Profiling

Analysis
Daemon
(~Compiler)

Dynamic
Optimization

Profile

Analysis
Data,
Optimized
Patch

Heavyweight
Analysis and
Optimization

Quality
Assurance

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Client

Server

PPRC Infrastructure and Optimization

- **Improving the infrastructure**
 - **Vulcan Client**
 - **Enhancements to Vulcan**
- **Improving Performance**
 - **Heterogeneous Components**
 - **Run Time Optimization**
 - **Enhancements to BBT**

Questions?